



Sensors on Solid Waste Vehicles

Problem Statement: To address City issues, departments often utilize 311 calls to drive operations. The problem with this approach are (1) it requires residents to call, which is a nuisance to residents; (2) it assumes that residents call when they see issues, which could lead to inequitable allocation of resources; and (3) it's difficult to strategically plan work, leading to inefficiencies.

Objective: Equip City vehicles with sensors to identify and collect real-time data on the City's infrastructure and areas of service need. The initial use case will retrofit sensors onto Solid Waste Management trucks to automatically identify and report potholes to Transportation & Capital Improvements (TCI) for repair.

Hypothesis: We believe sensors on City vehicles will (1) reduce calls (2) create efficiencies and (3) identify neglected areas of town where there are issues that no one is calling about and/or help inform allocation of resources.

Addresses City Manager Priorities:

- **Data Driven Decision-making** – Provides continuous unbiased survey of City's infrastructure.
- **Customer Service** – City can be proactive and address issues quickly, before complaints arise.
- **Financial Sustainability** – Identifies operational efficiencies and ensures equitable allocation of resources.

Research Questions:

Phase 1*	Identify the type of sensors to be used. How to install the sensors on SWMD trucks to effectively identify potholes and manage data?
Phase 2	Can we utilize the data gathered to strategically address potholes?
Phase 3	Can we utilize the data to identify unknown/neglected areas of need where we are not receiving 311 calls?
Phase 4	Can we apply lessons learned from the initial prototype to address other issues proactively/strategically such as roaming/dead animals, faded street signage, code violations, downed limbs?

Approach:

- 1) **Prototype/Technology:** Design prototype or procure applicable technology.
- 2) **Lab & Field Testing:** Test technology in lab and field environment for effectiveness and reliability.
- 3) **Experiment/Application:** Apply technology to two (2) SWMD vehicles.
- 4) **Report:** Establish recommendations on how the technology can improve City operations.
- 5) **Retrospective:** Gather lessons learned.

Roles & Responsibilities:

	Internal	External
Executive Champion	Nicholas Galus (SWMD) Anthony Chukwodolue (TCI)	Walt Downing (SwRI)
Lead Facilitator	Kate Kinnison (Innovation)	Michael Brown & Josh Johnson (SwRI)
Principal Investigator	Eryanne Taft (TCI)	Josh Johnson (SwRI)
Technical	SWMD: Daniel Enriquez, David Badillo Mark Lopez TCI: Frank Orta, Rolando Mata	SwRI: Ryan Condon, Prasana Kolar, Clay Weston
Report	Kate Kinnison (Innovation)	TBD
Support	Paula Stallcup (311)	Joe Auchter, Jerry Towler

Project Plan:

- Build up sensor platform and initial analysis with TCI data
- Data collection and initial analysis; Pothole Patrol truck and SWMD truck(s)
- Initial results and further analysis
- Phase 1 Report

**This timeline reflects phase 1*